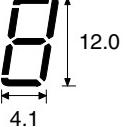


SHARP SERVICE MANUAL



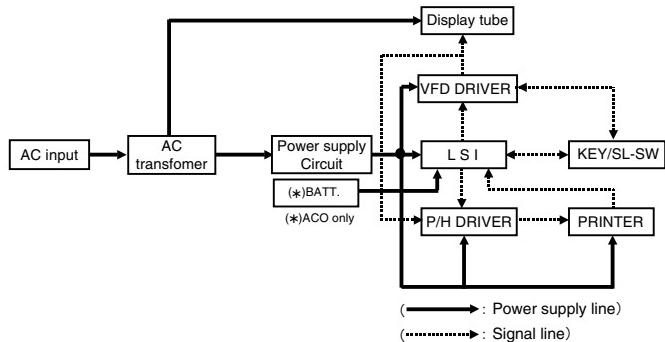
CODE : 00ZEL1607P/2E

MODEL EL-1607P (AAC,ACO,ABC,TRC)

STANDARD FUNCTION		12 digits	1 M	KEY LAYOUT						
D I S P L A Y		1,234,567,890.12 $\frac{M}{E}$								
ELEMENT: Display tube		PARTS NAME: 13-LT-47GN								
NUMERAL: 12 digits		SYMBOL: 1 digit (s)								
S E C T I O N										
L S I		Name : U3866-ZE731								
Type : COB										
Pin : 76 Pins										
POWER SUPPLY	AC: <input checked="" type="radio"/>	DC: <input type="checkbox"/>								
• BATTERY TYPE		AC only								
• MEMORY PROTECTION BATTERY (ACO only)		CR2032 x 1pc Approx. 2 years. (tested and confirmed at 25°C (77°F); may change due to usage environment)								
AC ADAPTOR										
RECHARGEABLE BATTERY										
POWER CONSUMPTION		220-230V: 48mA 230-240V: 48mA Multi : 8.1W								
AUTO POWER OFF TIME										
MEMORY PROTECT		Yes ^{※1} (TAX/Discount rate/Conversion rate)								
DIMENSIONS (mm)		220 (W) 303 (D) 71.5 (H)								
CALCULATIONS		Four arithmetic calculations, Constant calculation, Power calculation, Chain calculation, Reciprocal calculation, % calculation, Add-on (discount) calculation. Grand total calculation, etc.								
Note) ^{※1} : Enable only when power is supplied from the power cord or the backup battery.										
※2: At temperature 25°C (77°F), when "951 • +" is printed. The printing speed will vary with the number of rows and the figure types to be printed.										
P R I N T E R										
MODEL NAME		PTMFL87 (KI-OB1078CCZZ)								
PRINTING SYSTEM		Serial print type								
PRINTING CAPACITY		19 digits								
CHARACTER DIMENSION		1.6 (W) 3.5 (H) mm								
INPUT BUFFER		12 stages								
PRINTING SPEED		Approx. 3.0 lines/sec ^{※2}								
PAPER FEED SPEED		Approx. 8.5 lines/sec								
PAPER RELEASE MECHANISM		Yes (Forward only)								
INK RIBBON										
INK ROLLER (OPTION)		Black : EA-781R-BK, Red : EA-781R-RD								
INK LIFE		200 thousand characters								
PAPER		Plain paper								
PAPER SIZE (Roll paper)		58 ⁹ / ₁₆ mm (W), 80 mm in diameter DPAPR1004CSZZ 5rolls/pack								

Parts marked with "⚠" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

1. Block diagram

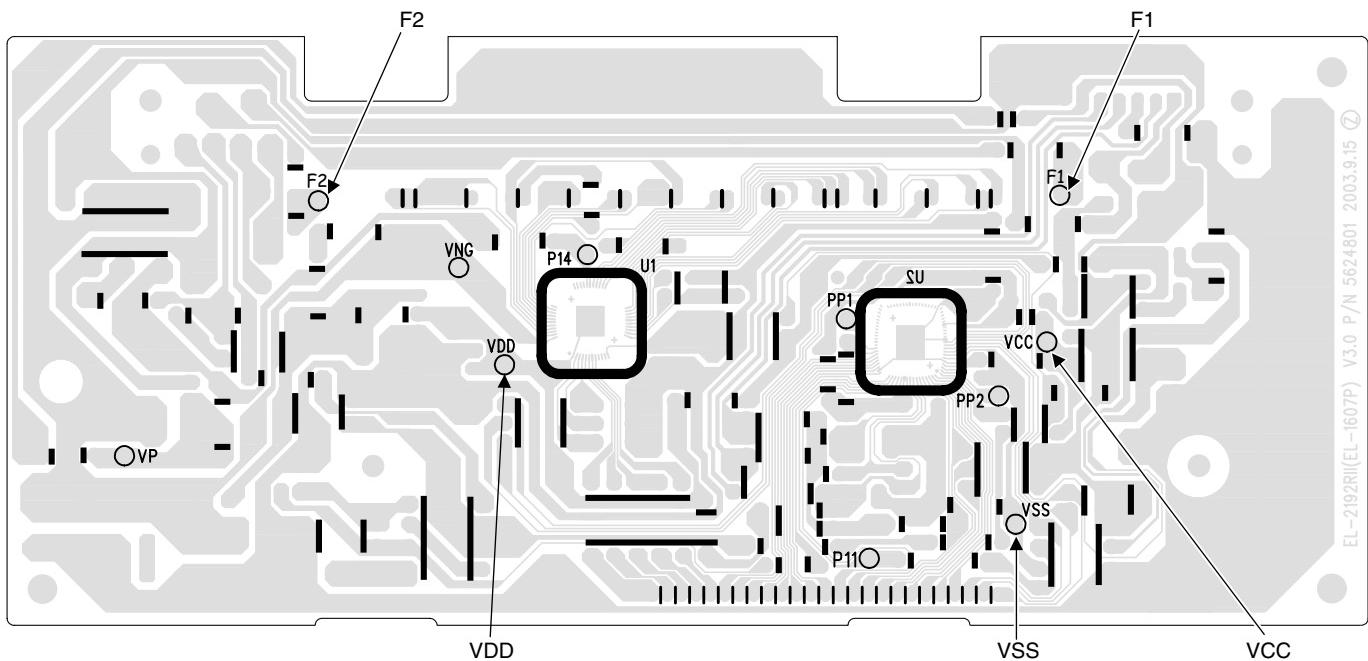


2. Power voltage

Measurement point	Power voltage
F1 - F2	4.0 VAC ~ 4.4 VAC
VSS - VDD	4.5 VDC ~ 5.5 VDC
VSS - VCC	

* Measure with the rated AC input voltage.

• MEASURING PIN POSITION



3. Ink roller replacement

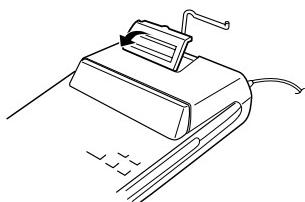
If printing is blurry even when the ink roller is in the proper position, replace the roller.

Ink roller: Type EA-781R-BK (Black)
Type EA-781R-RD (Red)

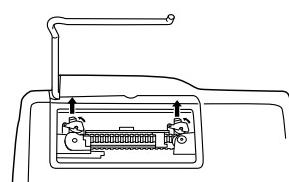
WARNING:

APPLYING INK TO WORN INK ROLLER OR USE OF UNAPPROVED INK ROLLER MAY CAUSE SERIOUS DAMAGE TO PRINTER.

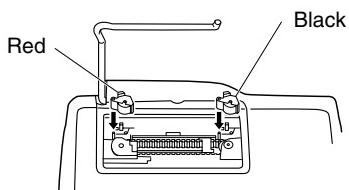
- Set the power switch to OFF.
- Remove the printer cover.



- Remove the ink roller by turning it counterclockwise and pulling it upward.



- Install the correct color new ink roller and press it in the correct position. Make sure that the ink roller is securely in place.



- Put back the printer cover.

Cleaning the printing mechanism

If the print become dull after long time usage, clean the printing wheel according to the following procedures:

- Remove the printer cover and the ink roller.
- Install the paper roll and feed it until it comes out of the front of the printing mechanism.
- Put a small brush (like a tooth brush) lightly to the printing wheel and clean it by pressing [].
- Put back the ink roller and the printer cover.

Note: • Never attempt to turn the printing belt or restrict its movement while printing. This may cause incorrect printing.

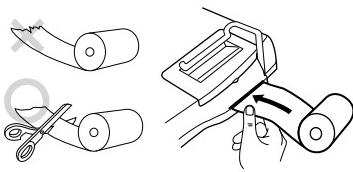
- Do not rotate the printing mechanism manually, this may damage the printer.

4. Paper roll replacement

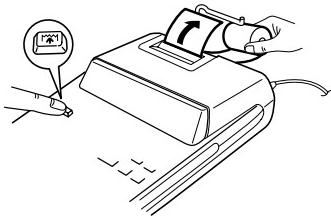
Never insert paper roll if torn. Doing so will cause paper to jam.

Always cut leading edge with scissors first.

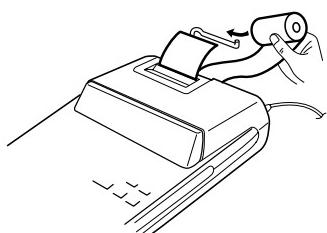
- Insert the leading edge of the paper roll into the opening.



- Turn the power on and feed the paper by pressing [].



- Lift the attached metal paper holder up and insert the paper roll to the paper holder.



DO NOT PULL PAPER BACKWARDS AS THIS MAY CAUSE DAMAGE TO PRINTING MECHANISM.

5. Replacement of battery for memory protection (for EL-1607P (ACO))

Time for battery replacement

Replace with a new battery once 2 year.

Method of battery replacement

Use one lithium battery (CR2032).

Note: When replacing the battery, the set tax/discount rate and conversion rate, the memory contents will be lost.

You may want to write down the tax/discount rate and conversion rate, other important numbers on a sheet of paper.

- Turn the power switch "OFF" and unplug the power supply plug from the outlet.
- Remove the battery cover on the back of the unit. (Fig. 1)
- Remove the exhausted battery and install one new lithium battery. Wipe the battery well with a dry cloth and place the plus "+" side upward. (Fig. 2)
- Replace the battery cover by reversing the removal procedure.
- Press the RESET switch on the back of the unit.

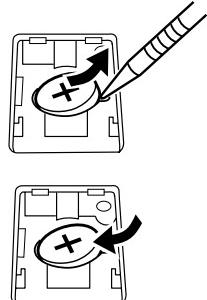
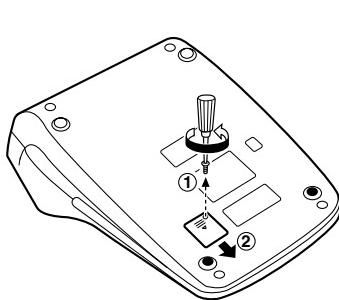


Fig. 1

Fig. 2

After battery replacement

- Connect the power supply plug to an outlet and turn the power switch "ON". Check that "0." is displayed. If "0." is not displayed, remove the battery, reinstall it, and check the display again.
- Reset the tax/discount rate and conversion rate.
- On the battery replacement date label found on the back of the unit, write down the month and year when the battery is replaced, as a reference for the next battery replacement.

Precautions on battery use

- Do not leave an exhausted battery in the equipment.
- Do not expose the battery to water or flame, and do not take it apart.
- Store batteries out of the reach of small children.

Notes for handling Lithium batteries:

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacture's instructions.

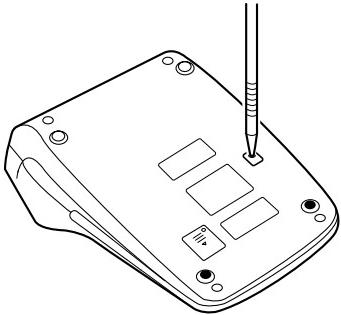
6. Resetting the unit (for EL-1607P (ACO))

Strong impacts, exposure to electrical fields, or other unusual conditions may render the unit inoperative, and pressing the keys will have no effect. If this occurs, you will have to press the RESET switch on the bottom of the unit. The RESET switch should be pressed only when:

- an abnormal event occurs and all keys are disabled.
- you install or replace the battery.

Note:

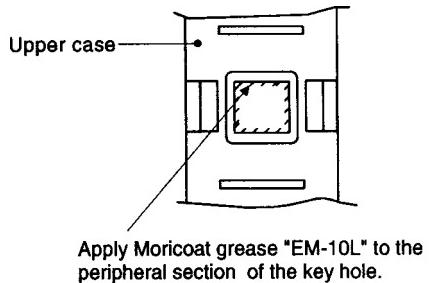
- Pressing the RESET switch will clear the stored tax/discount rate and conversion rate, other data stored in the memory.
- Use only a ballpoint pen to press the RESET switch. Do not use anything breakable or anything with a sharp tip, such as a needle.
- After pressing the RESET switch, connect the power supply plug to an outlet. Turn the power switch "ON" and check that "0." is displayed.



7. Servicing

(1) Apply grease to the upper case key hole.

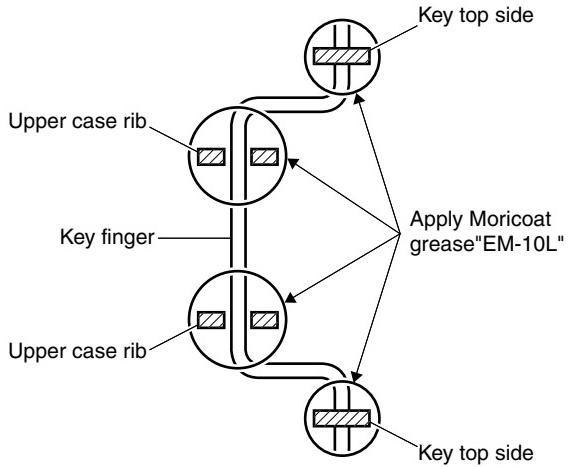
At first, spray the silicon spray to keyboard of upper case from back side (All keys).



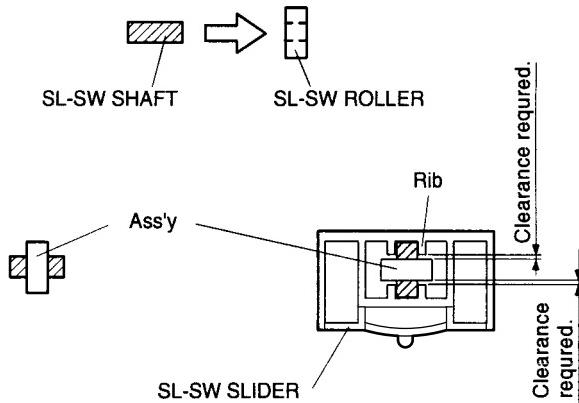
- Grease application to one position: $- =$ (1 key)
- Grease application to two positions: $0, \times$ (2 keys in total)
- Grease application to three positions: \pm (1 key)

PART NAME	PART CODE
GREASE "EM-10L"	UKOG-1014CCZZ

(2) Apply grease to \pm key and 0 key finger.



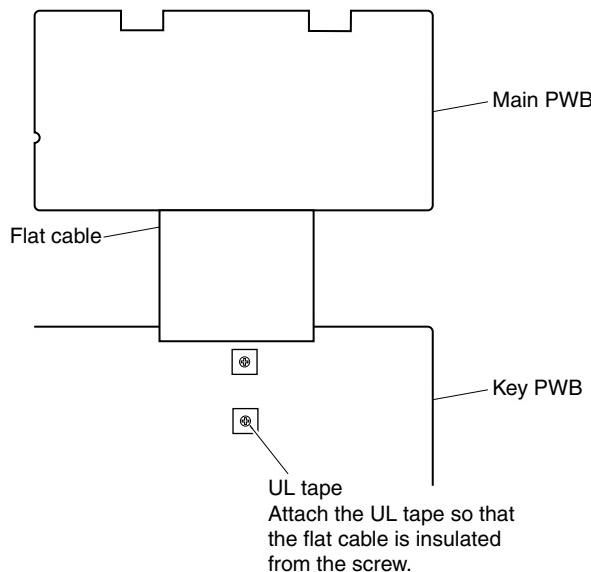
(3) Insertion of SL-SW roller into the shaft



*When inserting the ass'y into the SL-SW slider, allow a clearance between the rib and the SL-SW roller. (Refer to the figure above.)

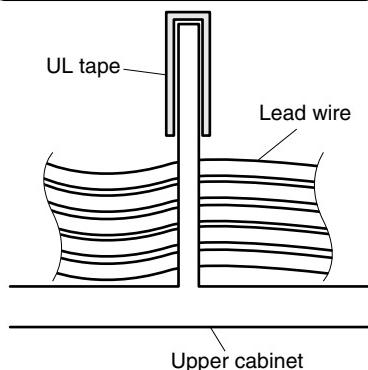
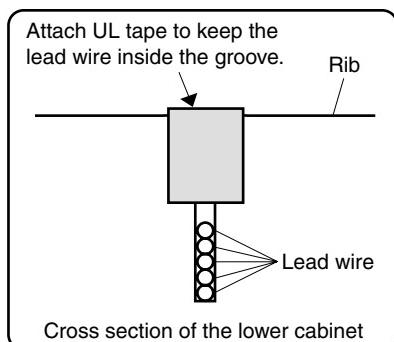
(4) UL tape attachment

Attach the UL tape as shown in the figure below in order to protect the flat cable from the screw head on the key PWB.



(5) Wiring of the secondary side of the transformer

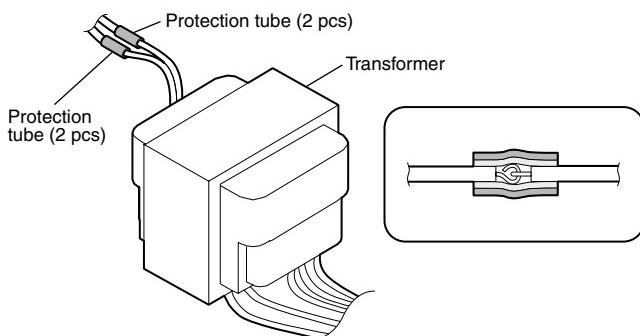
Pass the lead wire of the secondary side of the transformer through the slit section of the rib on the upper cabinet, and attach UL tape to the slit section to fix the lead wire.



(6) Protection tube

(6)-1. EL-1607P (AAC, ACO, ABC)

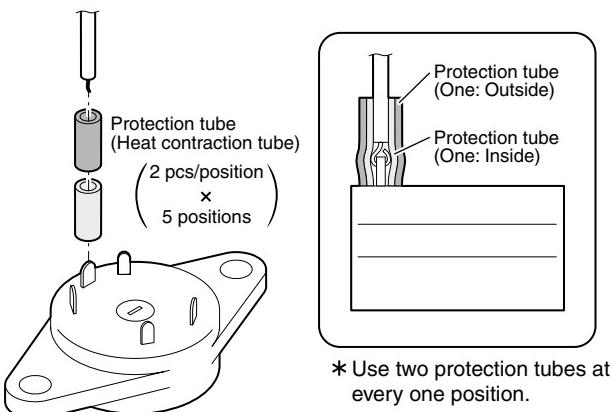
Insulate between the transformer and the AC cord connector with protection tubes (2 pcs × 2 positions).



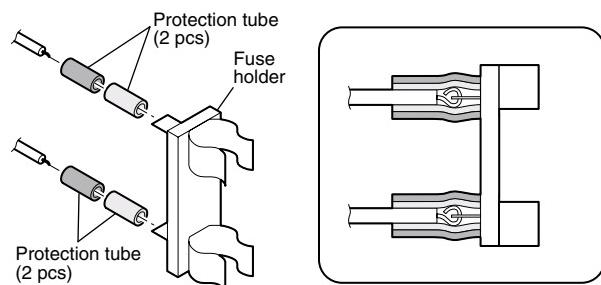
(6)-2. EL-1607P (TRC)

The EL-1607P (TRC) uses 14 protection tubes in total (that is, 2 pcs × 2 positions) as shown below.

[VOLTAGE SELECTOR]



[FUSE HOLDER]

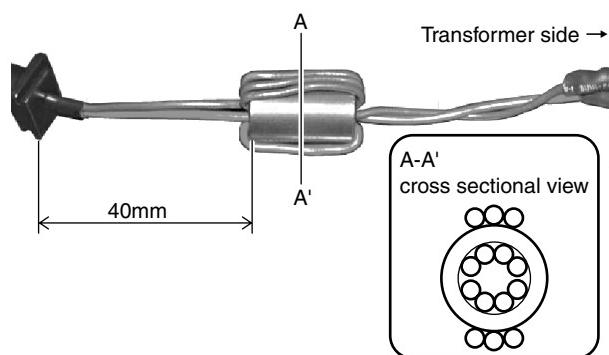


(7) Ferrite core ••• (for EL-1607P (AAC, ACO, ABC))

(7)-1.

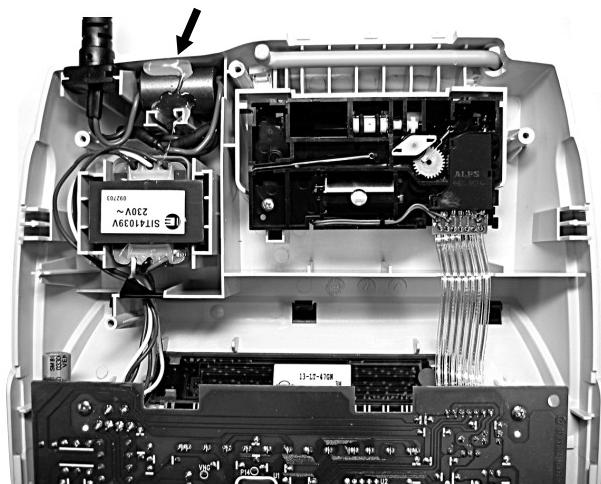
Wind the AC cord around the ferrite core so that the size is as shown in the figure below.

Wind every AC cord three times around the ferrite core.

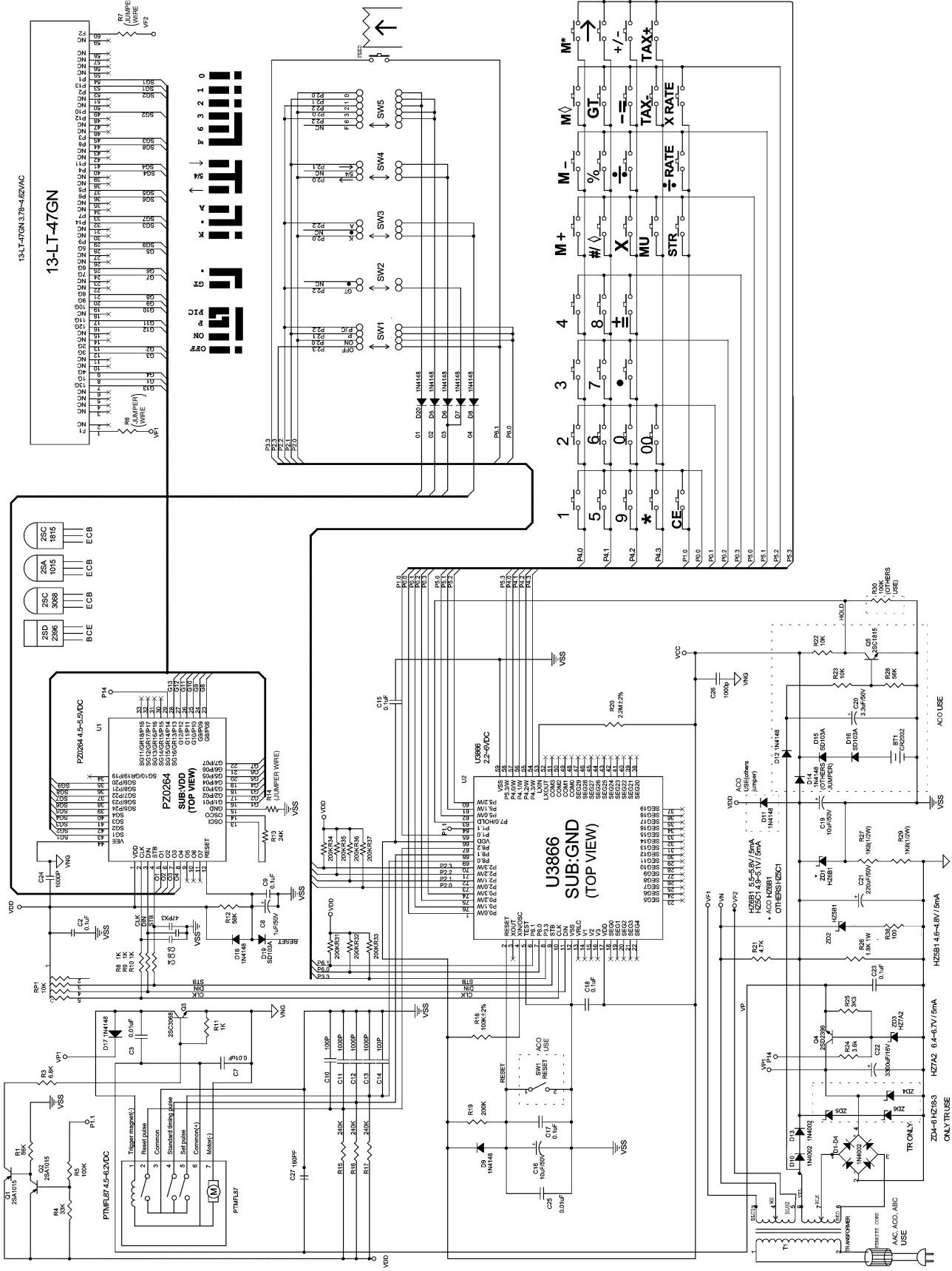


(7)-2. Fix the ferrite core to the cabinet

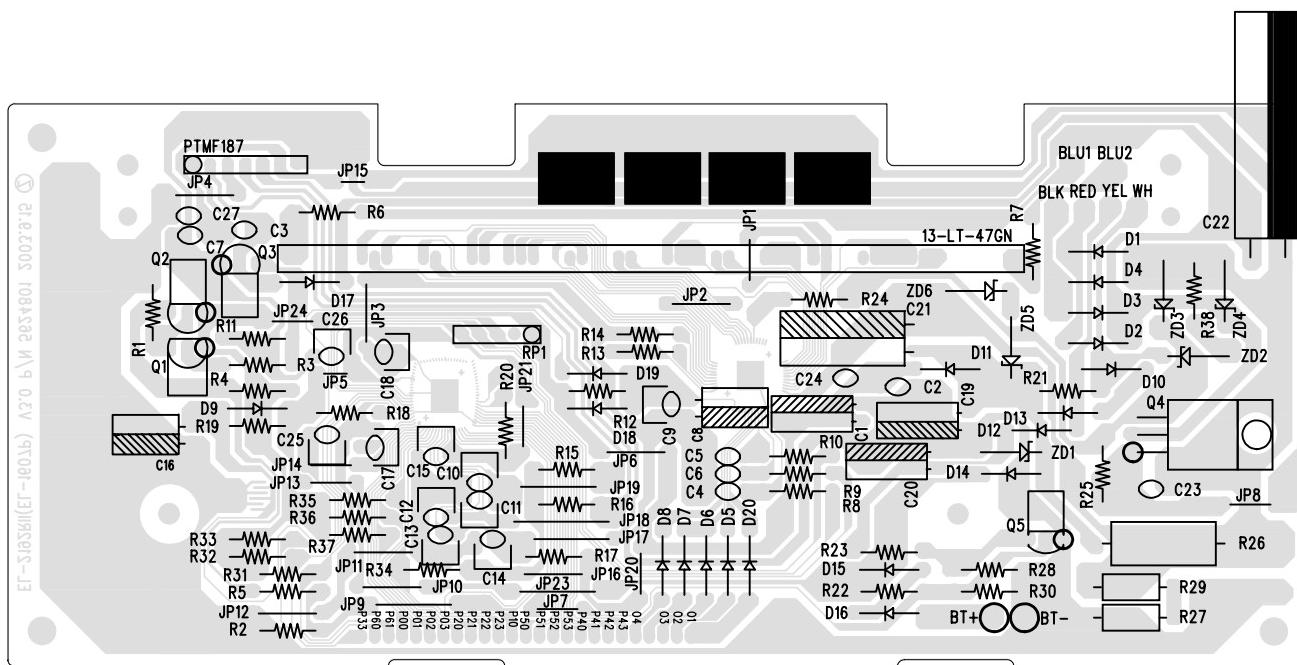
Fix the ferrite core by hot melt as shown in the figure below.



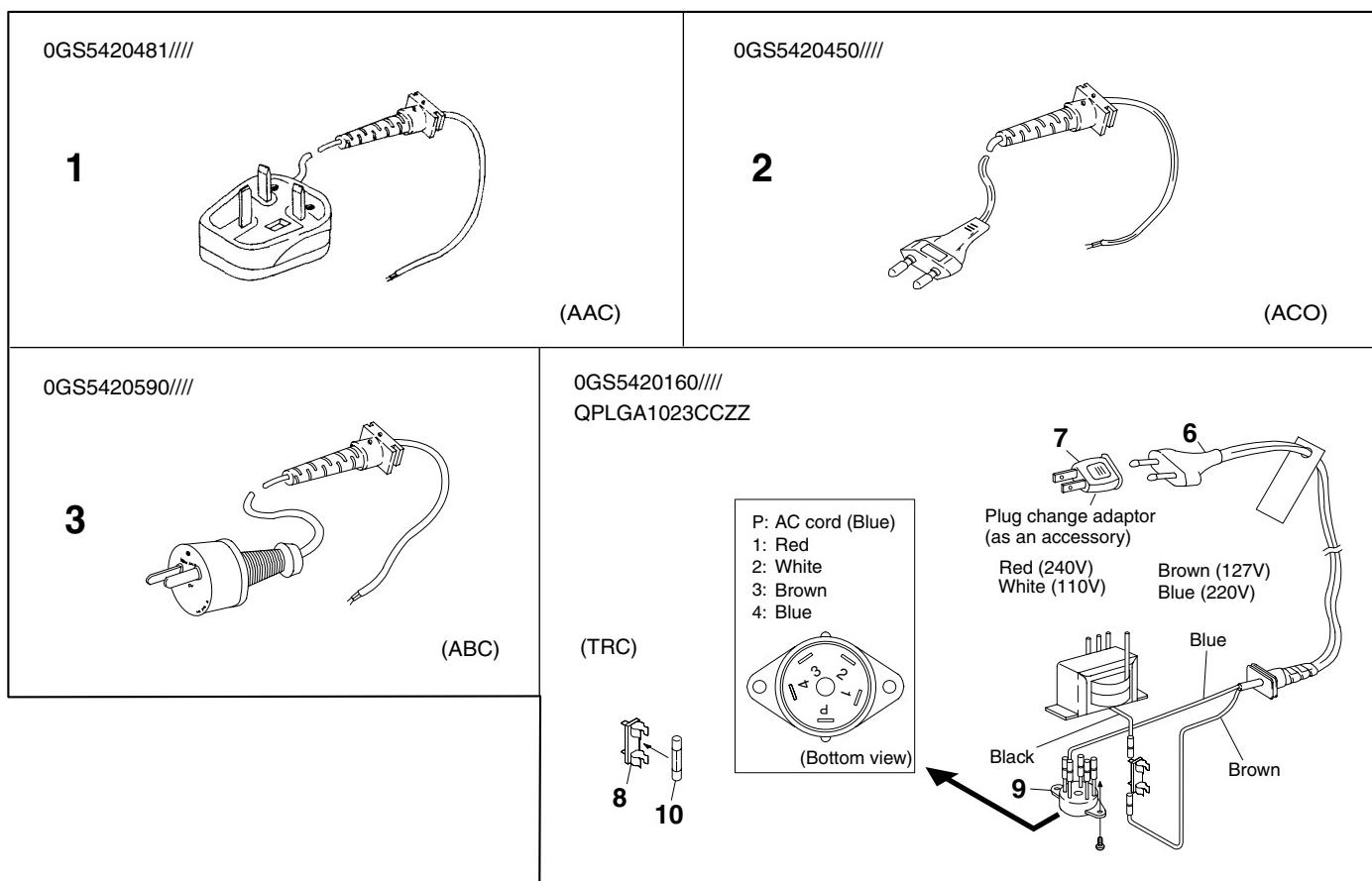
8. EL-1607P Circuit diagram



9. EL-1607P main PWB parts position



Plug shape



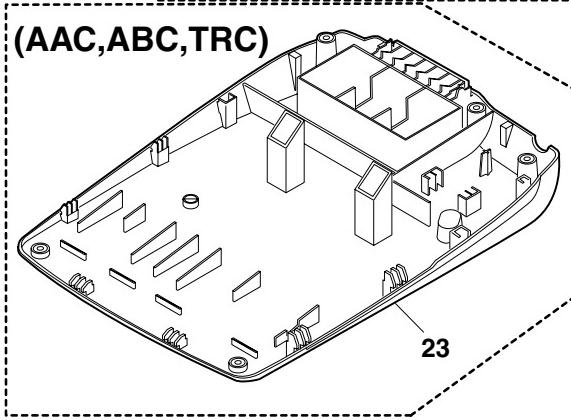
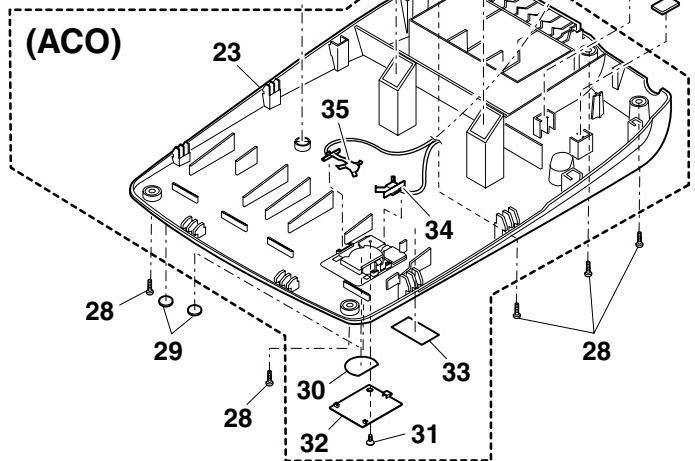
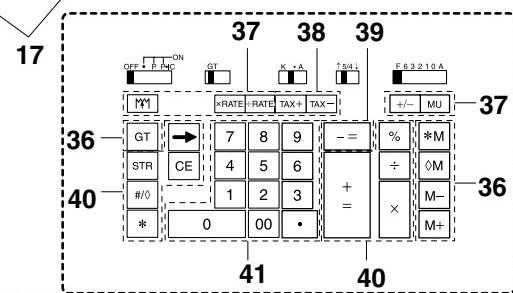
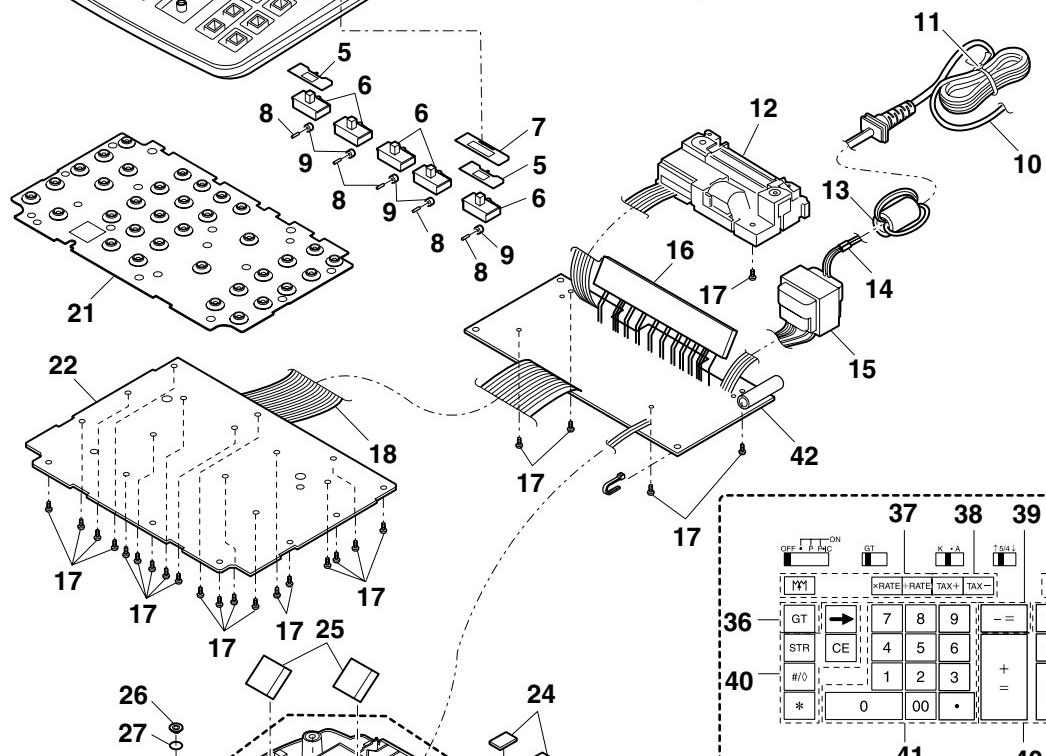
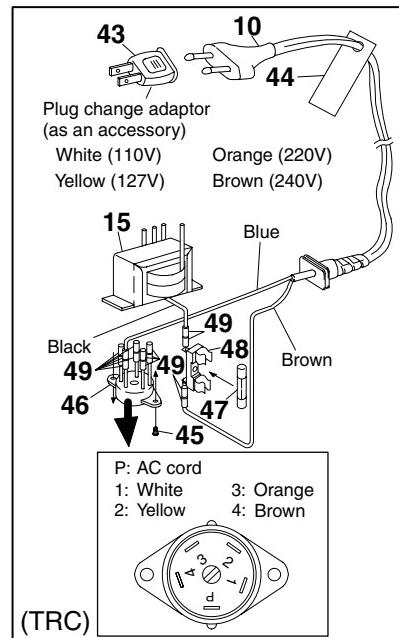
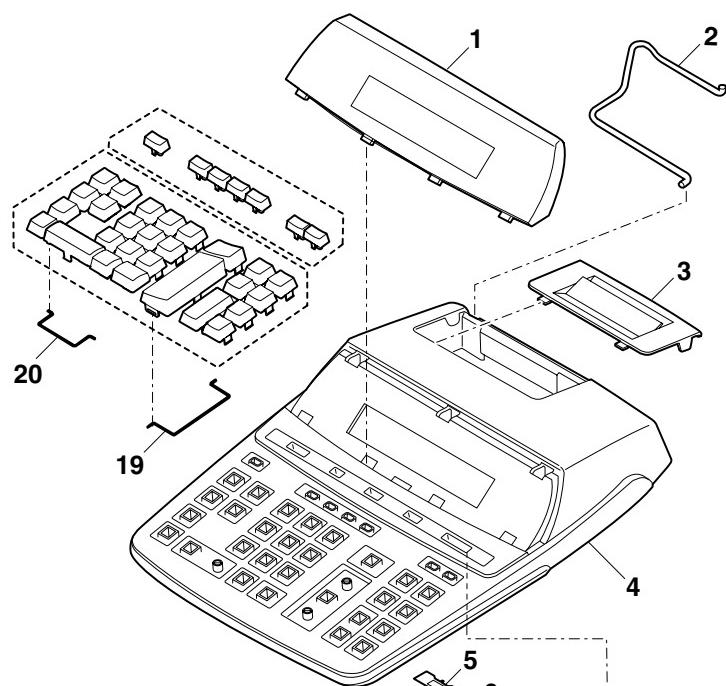
List of destinations (Destinations are determined by the name plate voltage and the plug shape.)

Destination	To identify destination		Major shipping country	Remarks
	Name plate voltage (V)	Plug shape No.		
AAC	220-230	1	U.K.	
ACO	220-230	2	SEEG	
ABC	230-240	3	SCA	
TRC	Multi (110/127/220/240)	6 and 7	Agent	

AC cord

NO.	PARTS CODE	PRICE RANK	Type of Lead		DESCRIPTION	MODEL NAME			
			2 LEAD	3 LEAD		EL-1607P (AAC)	EL-1607P (ACO)	EL-1607P (ABC)	EL-1607P (TRC)
1	0GS5420481////	AY	○		AC cord AAC	○			
2	0GS5420450////	AR	○		AC cord ACO		○		
3	0GS5420590////	AM	○		AC cord ABC			○	
4									
5									
6	0GS5420160////	AP	○		AC cord TRC				○
7	QPLGA1023CCZZ	AG	—	—	Plug change adaptor TRC				○
8	0GS6174280////	AD	—	—	Fuse holder TRC				○
9	0GS5253340////	AN	—	—	Voltage selector TRC				○
10	0GS3610270////	AD	—	—	Fuse (T125mA) TRC				○

■ PARTS GUIDE



CCP00321

1 Exteriors

2 Packing material & Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	0 G S 9 2 0 2 8 2 0 // / / /	AD		D	Manual(E/F/S)	[AAC]
	0 G S 9 2 0 2 8 3 0 // / / /	AD		D	Manual(E/G/F/S/I/N/SW/FI)	[ACO]
	0 G S 9 2 0 2 8 3 1 // / / /	AN	N	D	Manual(E/G/F/S/I/N/SW/FI)A(Russia)	[ACO]
	0 G S 9 2 0 2 9 9 0 // / / /	AD	N	D	Manual(E/F/S)	[ABC]
	0 G S 9 2 0 3 0 0 0 // / / /	AD	N	D	Manual(E/F/S)	[TRC]
2	0 G S 9 1 8 3 9 2 0 // / / /	AC		D	Warning leaflet for battery	[ACO]
3	0 G S 9 3 0 3 2 8 0 // / / /	AP		D	Gift box	[AAC]
	0 G S 9 3 0 3 2 9 0 // / / /	AP		D	Gift box	[ACO]
	0 G S 9 3 0 3 5 5 0 // / / /	AN	N	D	Gift box	[ABC,TRC]
4	0 G S 9 4 1 1 8 0 1 // / / /	AC		D	P.E.bag	[for AC CORD]
5	0 G S 9 4 2 8 7 4 0 // / / /	AP		D	Pulp mold(L)	
6	0 G S 9 4 2 8 7 5 0 // / / /	AP		D	Pulp mold(R)	
7	0 G S 9 4 1 3 7 2 0 // / / /	AE		D	P.E.bag	(for UNIT)(AAC,ACO)
8	0 G S 9 4 1 3 8 3 0 // / / /	AA		D	P.E.bag	(for Manual)(ACO)
9	0 G S 9 4 1 3 8 2 0 // / / /	AA		D	P.E.bag	(for BATTERY)(ACO)

3 PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	V C E A G U 1 H W 2 2 7 M	AC		C	Capacitor(50WV 220μF)	[C21]
2	0 G S 2 2 3 3 8 3 7 0 0 W E	AH		C	Capacitor(3300μF/16V)	[C22]
3	V C E A G U 1 H W 1 0 6 M	AB		C	Capacitor(50WV 10μF)	[C16,C19]
4	V C E A G U 1 H W 3 3 5 M	AA		C	Capacitor(50WV 3.3μF)	(ACO)[C20]
5	V C E A G U 1 H W 1 0 5 M	AA		C	Capacitor(50WV 1.0μF)	[C8]
6	V C K Y P U 1 H B 1 0 3 K	AA		C	Capacitor(50WV 0.01μF)	[C3,C7,C25]
7	0 G S 2 5 1 0 4 6 7 // / / /	AE		C	Capacitor(0.1μ/50V)	[C2,C9,C15,C17,C18,C23]
8	V C K Y P U 1 H B 1 0 2 K	AA		C	Capacitor(50WV 1000pF)	[C11,C12,C13,C24,C26]
9	V C K Y P U 1 H B 1 8 1 K	AA		C	Capacitor(50WV 180pF)	[C27]
10	V C K Y P U 1 H B 1 0 1 K	AA		C	Capacitor(50WV 100PF)	[C10,C14]
11	V C K Y P U 1 H B 4 7 0 K	AA		C	Resistor(47pF/50V)	[C4,C5,C6]
12	V R D - H T 2 E Y 5 6 3 J	AA		C	Resistor(1/4W 56KΩ ±5%)	[R1,R12]
	V R D - H T 2 E Y 5 6 3 J	AA		C	Resistor(1/4W 56KΩ ±5%)	(ACO)[R28]
13	V R D - H T 2 E Y 6 8 2 J	AA		C	Resistor(1/4W 6.8KΩ ±5%)	[R3]
14	V R D - H T 2 E Y 3 3 3 J	AA		C	Resistor(1/4W 33KΩ ±5%)	[R4]
15	V R D - H T 2 E Y 1 0 4 J	AA		C	Resistor(1/4W 100KΩ ±5%)	[R5]
16	V R D - H T 2 E Y 1 0 4 J	AA		C	Resistor(1/4W 100KΩ ±5%)	(AAC,ABC,TRC)[R30]
17	V R D - H T 2 E Y 1 R 0 J	AA		C	Resistor(1/4W 1Ω ±5%)	(AAC,ACO)[R6,R7,R14]
18	V R D - H T 2 E Y 1 0 2 J	AA		C	Resistor(1/4W 1KΩ ±5%)	[R8,R9,R10,R11]
19	V R D - H T 2 E Y 2 4 3 J	AA		C	Resistor(1/4W 24KΩ ±5%)	[R13]
20	V R D - H T 2 E Y 2 4 4 J	AA		C	Resistor(1/4W 240KΩ ±5%)	[R15,R16,R17]
21	V R D - H T 2 E Y 1 0 4 G	AA		C	Resistor(1/4W 100KΩ ±2%)	[R18]
22	V R D - H T 2 E Y 2 0 4 J	AA		C	Resistor(1/4W 200KΩ ±5%)	[R19,R31,R32,R33,R34,R35,R36,R37]
23	0 G S 1 0 2 2 5 6 G // / / /	AA		C	Resistor(1/4W 2.2MΩ,±2%)	[R20]
24	V R D - H T 2 E Y 4 7 2 J	AA		C	Resistor(1/4W 4.7KΩ ±5%)	[R21]
25	V R D - H T 2 E Y 1 0 3 J	AA		C	Resistor(1/4W 10KΩ ±5%)	(ACO)[R22,R23]
26	V R D - H T 2 E Y 3 6 2 J	AA		C	Resistor(1/4W 3.6KΩ ±5%)	[R24]
27	V R D - H T 2 E Y 3 3 2 J	AA		C	Resistor(1/4W 3.3KΩ ±5%)	[R25]
28	0 G S 1 9 0 1 6 1 0 // / / /	AC		C	Resistor(1W 1.8kΩ,±5%)	[R26]
29	V R D - H T 2 H Y 1 8 2 J	AA		C	Resistor(1/2W 1.8KΩ ±5%)	[R27,R29]
30	V R D - H T 2 H Y 1 0 1 J	AA		C	Resistor(1/2W 100Ω ±5%)	[R38]
31	V H E H Z 5 C 1 // / / - 1	AB		B	Zener diode(HZ5C1)	(AAC,ABC,TRC)[ZD1]
	V H E H Z 6 B 1 // / / - 1	AB		B	Zener diode(HZ6B1)	(ACO)[ZD1]
32	0 G S 4 1 5 1 4 9 1 // / / /	AE		B	Zener diode(HZ5B1)	[ZD2]
33	V H E H Z 7 A 2 // / / - 1	AC		B	Zener diode(HZ7A2)	[ZD3]
34	V H D 1 0 E 1 N // / / - 1	AB		B	Diode(10E1N)	[D1,D2,D3,D4,D10,D13]
35	V H D D S S 1 3 1 // / / - 1	AA		B	Diode(DSS131)	[D5,D6,D7,D8,D9]
	V H D D S S 1 3 1 // / / - 1	AA		B	Diode(DSS131)	[D17,D18,D20]
	V H D D S S 1 3 1 // / / - 1	AA		B	Diode(DSS131)	(ACO)[D11,D12,D14]
36	0 G S 4 1 4 0 6 4 0 // / / /	AC		B	Diode(SD103A)	[D19]
	0 G S 4 1 4 0 6 4 0 // / / /	AC		B	Diode(SD103A)	(ACO)[D15,D16]
37	V S 2 S A 1 0 1 5 - Y - 1	AB		B	Transistor(2SA1015Y)	[Q1,Q2]
38	V S 2 S C 3 0 6 8 - / - 1	AD		B	Transistor(2SC3068)	[Q3]
39	V S 2 S D 2 3 9 6 J K - 1	AE		B	Transistor(2SD2396)	[Q4]
40	V S 2 S C 1 8 1 5 - G R C	AB		B	Transistor(2SC1815-GRC)	(ACO)[Q5]
41	0 G S 1 9 1 1 0 3 0 // / / /	AD		C	Resistor(1/8W 10kΩ×4,±5%)	[RP1]
42	0 G S 4 1 5 1 4 8 0 // / / /	AD		B	Zener diode(HZ18-3)	(TRC)[ZD4,ZD5,ZD6]
	(Unit)					
901	0 G S E L 1 6 0 7 P 3 0 A A	BK		E	PWB unit(PWB Unit = Main PWB + all parts except the printer unit,transformer,key PWB and cables.)	[AAC]
	0 G S E L 1 6 0 7 P 3 0 A C	BK		E	PWB unit(PWB Unit = Main PWB + all parts except the printer unit,transformer,key PWB and cables.)	[ACO]
	0 G S E L 1 6 0 7 P 3 0 A B	BK	N	E	PWB unit(PWB Unit = Main PWB + all parts except the printer unit,transformer,key PWB and cables.)	[ABC]
	0 G S E L 1 6 0 7 P 3 0 T R	BK	N	E	PWB unit(PWB Unit = Main PWB + all parts except the printer unit,transformer,key PWB and cables.)	[TRC]

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